

Kanlayanee Punbo 2011: Enhancing Thai Chemistry Teachers' Teaching for Critical Thinking through a Professional Development Program. Doctor of Philosophy (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Assistant Professor Naruemon Yutakom, Ph.D. 233 pages.

This interpretive case study examines how a professional development program (PD) on teaching for critical thinking (CT) enhances chemistry teachers' understanding and teaching practices for CT. Three chemistry teachers who taught grade 10-12 participated in the study. The PD program was composed of two Phases. Phase I examined teachers' prior understanding of and teaching practices for CT and developed workshop activities based upon their understanding and practices. Phase II examined how the teachers applied their knowledge from the PD program into their teaching practices. The data gathered included: classroom observations of teaching practices, interviews with teachers, teacher group meetings, teacher reflective journals, teacher questionnaire, lesson document analysis, and interviews with students. Each teacher comprised a case and a cross-case analysis was carried out.

Results from the study indicated that the teachers' prior understanding of CT could be characterized in terms of abilities to answer questions with supporting reasons and to apply Chemistry knowledge in real-life. Their practice could be characterized as teacher-driven and content-driven instruction. Based on analysis of the data, following the PD activities, the teachers showed a greater understanding of and teaching practices for CT. The following teaching practices were observed: conducting interactive classroom activities, using questions that showed evidence of challenging students to provide reasons for their responses, engaging students in hands-on and minds-on activities, using high cognitive tasks, and authentic assessment. Important features of the PD program included: a year-long participation, focusing on collaborative learning among teacher participants and between the participants and the researcher, providing an intensive workshop on teaching for CT in Chemistry, in which the participating teachers gained experience in teaching in the context of teaching for CT in Chemistry.

The results of the analysis suggest that the PD program with the above features can be valuable to enhance teachers' understanding of and teaching for CT. However, further studies should examine the extent to which these changes are sustainable over time. To meet the Thai National Reform goals of promoting students' CT, a further study should investigate the effects of teachers' use of CT teaching strategies on students' learning and thinking abilities.

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Thesis Advisor's signature